

P2.21**Response of faecal indicators to effluents dispersal of three wastewater treatment plants in ria formosa lagoon – south Portugal**

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Abstract

Ria Formosa (RF) is a highly productive coastal lagoon located in south of Portugal and the most important national bivalve producer. RF receives treated effluents from several Wastewater Treatment Plants (WWTP). Depending on effluent loads, location of discharge points and hydrodynamics, these could impact bivalves, (deeply reliant on water quality) human health, and socio-economic activities. Thus, studies of microbial indicators of faecal contamination are crucial in systems such as RF under the influence of effluents dispersal. This study compares the dispersion of *Escherichia coli* (EC) and Enterococci (E) at three areas in RF near bivalve production areas, influenced by WWTP, monthly (low tide) from September 2018 to September 2020. These areas are representative of different effluent discharge and hydrodynamics of the receiving waters: site 1- low flow (2000 m³/day), at a main channel, deep and wide in connection with a main inlet with high water renewal; site 2 – intermediate flow (4000 m³/day), at an intermediate channel in direction to a main channel; site 3 - high flow (16000 m³/day), at a shallow and narrow channel, with restricted circulation. Considering both bacteriological indicators, lower contamination was detected at site 1 and higher at site 3, reflecting higher effluent discharge and weaker hydrodynamics at the later. This pattern was also supported by other chemical key water quality determinants A higher ratio of concentration of EC to E was also observed at site 3. For each area, faecal indicators decreased gradually with the distance from the discharge point. No consistent intra-annual variability pattern was detected. These results allow a better understanding of the impact of different WWTP on RF water quality, crucial for future wastewater management, which ultimately contribute to protect the valuable bivalve resources. Moreover, this knowledge could be extended to other similar systems worldwide.

Keywords

Faecal indicators , Waste Water Treatment Plant, Water quality, Coastal Lagoons